

*USE OF RESPONSE CARDS WITH A GROUP OF  
STUDENTS WITH LEARNING DISABILITIES INCLUDING  
THOSE FOR WHOM ENGLISH IS A SECOND LANGUAGE*

LINDA L. DAVIS

SALT LAKE CITY SCHOOL DISTRICT

AND

ROBERT E. O'NEILL

UNIVERSITY OF UTAH

The current study compared the effects of hand raising and response cards during a writing instruction class in a middle-school resource classroom with students who were learning English as their second language. Response cards increased the rate and accuracy of academic responding, increased weekly quiz scores, and had mixed effects on off-task behavior, but most students reported that they preferred hand raising.

DESCRIPTORS: ESL services, learning disabilities, response cards

Active student responding is a critical component of effective instruction in classroom settings (Heward, 1994). One low-tech strategy developed to facilitate active student responding during group instruction involves the use of response cards. Typically, this approach involves the teacher asking questions during group instruction and having each student write down his or her answers on response cards and then display those responses for teacher feedback and correction (Heward, 1994; Narayan, Heward, Gardner, Courson, & Omness, 1990). The present study sought to extend existing research by evaluating the effects of response cards on academic and off-task responding during writing instruction in a resource classroom among students with learning dis-

abilities, some of whom had English as their second language (ESL).

## METHOD

### *Participants and Setting*

Participants were seventh- and eighth-grade students enrolled in a middle-school English class for students with learning disabilities, including students who also were receiving ESL instruction. Six of the 11 students in the class were initially selected for data collection because of reported low levels of active responding and high levels of off-task behavior, but 2 of these students were removed from the classroom by the school administration due to ongoing problem behaviors and were dismissed from the study at that time. The remaining 4 students included 2 seventh-grade girls who qualified for ESL and special education services (because of identified learning disabilities), 1 eighth-grade boy with learning disabilities, and 1 eighth-grade girl with traumatic brain injury. Sessions were conducted in an English class that focused on writing skills such as grammar, usage, and writing business and personal letters.

---

This study is based on a thesis submitted by the first author to the Department of Special Education at the University of Utah for the MS degree. We thank the children and their families for participating in the study and Woody Johnson for his input and guidance during the course of the study.

Correspondence and requests for reprints should be directed to Rob O'Neill, Department of Special Education, University of Utah, 1705 E. Campus Center Drive, Room 221, Salt Lake City, Utah 84112 (e-mail: roneill@ed.utah.edu).

### *Measurement*

The primary dependent measures were (a) percentage of trials with questions to which students made an academic response (written or verbal) during hand-raising and response-card conditions, (b) percentage of correct academic responses, (c) percentage of trials with questions to which students responded by raising their hands (only recorded during hand-raising conditions), and (d) percentage of trials with questions with off-task behavior (students did not produce an academic response and were engaging in other disruptive behavior such as talking to their neighbor). In addition, the percentage of correct responses was calculated for responses to weekly 12-question quizzes covering the material taught during the preceding week. Each quiz consisted of fill-in-the-blank items randomly selected from the questions presented during the daily sessions of the preceding week. After the completion of the study, students completed a six-item questionnaire asking whether they preferred hand raising or response cards, and which approach they felt best facilitated their participation and learning (questionnaire available from the second author upon request).

Classroom observers collected the data. After a question was presented by the teacher, the observer recorded whether the student raised his or her hand during the hand-raising conditions, whether he or she made a verbal or written academic response, if the response was correct, and if he or she did not respond, whether he or she was engaged in disruptive behavior at that moment (talking out, talking to a classmate, or playing with objects). Two independent observers collected data during 30% of the sessions distributed across all phases of the study. Point-by-point agreement was calculated and averaged 93% for hand raising, 93% for academic responses and their accuracy, and 91% for off-task behavior.

### *Procedure and Experimental Design*

During the first 15 to 20 min of instruction, class material was presented via direct instruction and guided note taking. During the next 10 to 15 min, during which response data were collected, the teacher presented fill-in-the-blank questions related to the day's lesson. Students responded by either hand raising or response cards. During hand-raising conditions, which was the typical format used by the teacher prior to the study, the teacher attempted to call on students as randomly as possible. After the student responded, the teacher provided verbal praise or corrective feedback as needed while she wrote the correct answer on the overhead projector. During response-card conditions, the students responded with one- or two-word answers on erasable white boards that they held up, and the teacher provided general positive or corrective feedback. During the hand-raising phases, students received one bean in a jar for raising their hands and an additional bean if they were called on and responded correctly. During the response-card phases, students received a bean for writing an answer regardless of accuracy. Full jars resulted in a student receiving a candy bar or soda, and filling a predetermined number of jars resulted in the class receiving a class activity or field trip.

The study employed an ABAB reversal design, alternating between hand-raising and response-card conditions. Following two phases of each condition, periodic probes of the response-card condition were conducted every 2 to 3 days during a 3-week follow-up period.

## RESULTS AND DISCUSSION

Figure 1 shows the percentage of trials with questions with academic responses, hand raising, and off-task responding for each student. For all students, the response-card condition resulted in higher levels of

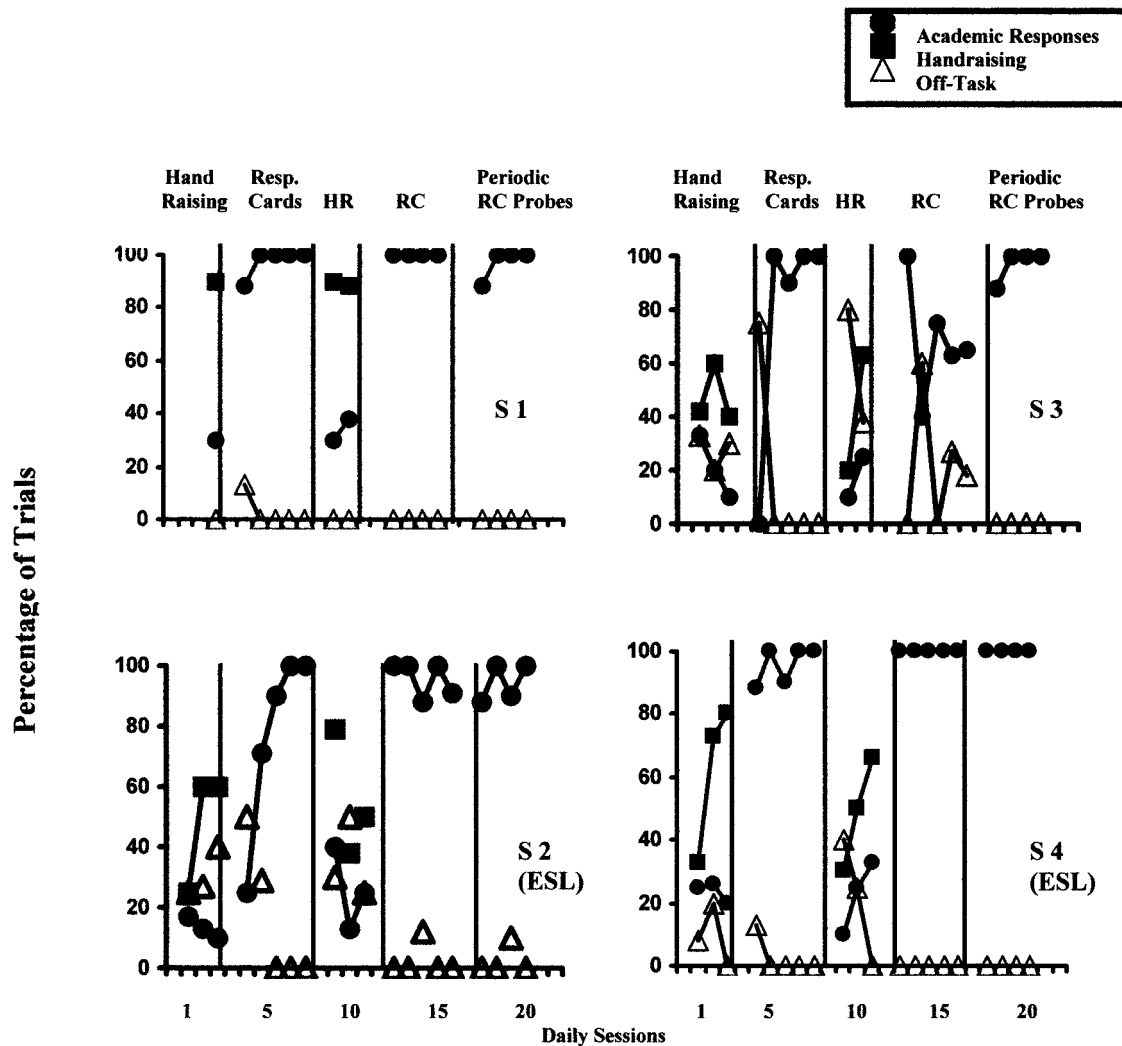


Figure 1. The percentage of trials with academic responses (spoken or written), hand raising, and off-task behavior in hand-raising (HR) and response-card (RC) conditions. Students S2 and S4 were the 2 students receiving ESL services.

academic responses during both initial presentation and follow-up probes. The students exhibited moderate to high levels of hand raising during the hand-raising conditions, with increasing trends apparent in some phases (S4). Results for off-task behavior were mixed, with only S2 demonstrating consistently lower levels of such behavior during response-card conditions. Students displayed higher average levels of correct academic responding during response-card conditions ( $M = 91\%$ ) than in the hand-

raising conditions ( $M = 74\%$ ), and group average weekly quiz scores were substantially higher during the response-card conditions ( $M = 88\%$ ) than in the hand-raising conditions ( $M = 19\%$ ). However, social validity data indicated that all but 1 of the students preferred the hand-raising condition. Their questionnaire responses indicated that this was mainly due to the burden of having to write their responses to questions. Other than this, however, they listed more negative things about hand raising than response

cards, such as the classroom being too noisy, having only 1 student called on, and lower quiz scores.

This study was limited with regard to its relatively short duration and the small number of participants eligible for ESL services. However, it extends the existing literature in its application of response cards in a resource-room setting with students with learning disabilities, including students eligible for ESL services, and its attempt to document effects on off-task behavior. Interestingly, the social validity data indicated a student preference for hand raising, an outcome that differs from previous studies (Gardner, Heward, & Grossi, 1994; Narayan et al., 1990). This could have been due to the students' documented difficulties in reading and written language, which may have made the written response-card format more aversive. This preference is interesting in light of potential relative reward rates across conditions. Students received tokens (beans) for either raising their hands or writing an answer on a response card. Rates of writing were generally higher than rates of hand raising (and academic responses in hand-raising conditions) for most students (see Figure 1). It is also possible that students preferred the hand-raising condition because they had the opportunity to receive an extra token (bean) if they were called on and provided an answer.

Future research investigating response cards should include larger groups of students receiving ESL services, collect and report data on actual rates of reinforcement, and look at the relation of these rates to expressed student preferences. Such studies should also consider possible alternative response formats (e.g., preprinted yes-no cards), implementation in various academic subject areas, and comparisons with other response modes, such as choral or computer-based responding.

## REFERENCES

- Gardner, R., Heward, W. L., & Grossi, T. A. (1994). Effects of response cards on student participation and academic achievement: A systematic replication with inner-city students during whole class science instruction. *Journal of Applied Behavior Analysis, 27*, 63-71.
- Heward, W. L. (1994). Three low-tech strategies for increasing the frequency of active student response during group instruction. In R. Gardner, D. M. Sainato, J. O. Cooper, T. E. Heron, W. L. Heward, J. W. Eshleman, & T. A. Grossi (Eds.), *Behavior analysis in education: Focus on measurably superior instruction* (pp. 283-320). Pacific Grove, CA: Brooks/Cole.
- Narayan, J. S., Heward, W. L., Gardner, R., Courson, F. H., & Omness, C. K. (1990). Using response cards to increase student participation in an elementary classroom. *Journal of Applied Behavior Analysis, 23*, 483-490.

*Received February 25, 2003*

*Final acceptance February 17, 2004*

*Action Editor, Linda Cooper-Brown*